



伺服仿真机械手
Servo Emulational Manipulator

青岛海德马克智能装备有限公司
Qingdao HDMECH Intelligent Equipment Co.,LTD.

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HDMECH
QINGDAO HDMECH INTELLIGENT EQUIPMENT CO.,LTD

精细化的产品 国际化的海德马克

www.hdmech.com

公司简介 Company Profile

青岛海德马克智能装备有限公司（“海德马克”或“公司”）原青岛华东工程机械有限公司，成立于1994年10月28日，注册资金6166万元，位于青岛市高新技术产业开发区春阳路北侧、思源路西侧，公司厂区占地面积13.9万平方米（208亩），总资产3.57亿，现有员工170余人。

海德马克，是一家从事智能化生产线、机器人、物联网技术研发、设计、制造、销售、服务于一体的国家高新技术企业。主要产品包括：冰箱（冷柜）智能化生产线、洗衣机智能化生产线、油烟机智能化生产线、热水器智能化生产线、工业机器人、智能无人高精密锻造操作装备、径锻机、智能数控碾环机、智能数控热处理装备等。

海德马克，先后服务于海尔、海信、美的、澳柯玛、TCL、GE、格力、倍科、一重、二重、上重、太重、沈重、大连华瑞、无锡叶片、马钢、宝钛以及德国罗特艾德等知名企业。

Qingdao HDMECH Intelligent Equipment Co. Ltd. (“HDMECH”) Qingdao Huadong Engineering Machinery Co. Ltd., founded in October 28, 1994, registered capital of 61.66 million yuan, is located in Qingdao high tech Industrial Development Zone, between the north of Chunyang Road, and the west of Siyuan Road, the company covers an area of 139 thousands square meters (208 acres), with total assets of 357 million and enrolled employees more than 170.

HDMECH, is a national high-tech enterprise engaged in the R&D, designing, manufacturing, sales of home appliance intelligent production line, robot, internet of things technology. The main products include: refrigerator (freezer) intelligent production line, wash machine intelligent production line, kitchen ventilator intelligent machine production line, heater intelligent production line, intelligent unmanned-operation high precision forging equipment, industrial robots, intelligent CNC ring rolling machine, radial forging machine, intelligent CNC heat treatment equipment etc..

HDMECH has been supplied production line for Arcelik, Haier, Hisense, Midea, AUCMA, GREE, TCL, GE, and CFHI, CNEG, TAYOR, TYHI, NHI, DHHI, WTB, MIS, BaoTi and Germany Rothe Erde and other famous enterprises.

国家高新技术企业
山东省企业技术中心
青岛市液力装备工程技术研究中心
多个创新研发项目列入国家、省市重点技术创新项
60t数控重载锻造操作机技术被列入2010年度国家火炬计划
1000kg全液压重载机器人项目列入国家扩大内需重点资金支持项目
智能无人高精密锻造操作装备（800KN）被评为2015年度山东省首台套技术装备
260t锻造操作机项目获得青岛市重点技术攻关项目
数控精密锻造基层技术研发，被列入青岛市关键技术攻关计划
“18MN径向锻造压机、径向锻造操作机”被认定为2014青岛市企业技术创新重点项目
冷柜全自动钣金铆接线开发被列入青岛市企业技术创新重点项目计划
对开门冰箱门壳自动化生产线的开发被列入青岛市企业技术创新重点项目计划
洗衣机全自动内筒成型线的开发被列入青岛市企业技术创新重点项目计划

National high-tech enterprise
Shandong Enterprise Technology Center
Qingdao hydraulic equipment Engineering Technology Research Center
A number of innovative R & D projects included in the national, provincial key technological innovation projects
60t CNC heavy duty forging manipulator technology was included in the 2010 National Torch Program
1000kg all hydraulic heavy duty robot project included in the national expansion of domestic demand key funding projects
Intelligent unmanned operation high precision forging equipment (800KN) was named the 2015 annual Shandong province first sets of technical equipment
The project of 260t forging machine has been awarded the key technical project of Qingdao
CNC precision forging technology research and development, has been included in the key technology projects in Qingdao
"18MN radial forging press, radial forging manipulator" was identified as the 2014 Qingdao enterprise technology innovation key projects
Refrigerator automatic sheet metal rivet line development was included in the key projects of Qingdao city enterprise technology innovation plan
The development of the automatic door shell production line of the French door refrigerator was included in the key project of Qingdao enterprise technology innovation
The development of full automatic washing machine drum forming line of was included in the key project of enterprise technology innovation in Qingdao

技术专利 Technology Patents

装料取料伺服仿真机械手发明专利
生产线传输对中机构及其方法发明专利
金属板料滚边装置及其方法发明专利
机械手及其夹持方法发明专利
钣金件复合加工模具及其方法发明专利
装出料机及其控制方法发明专利
机械手控制系统及控制方法发明专利
自动对中装置、对中方法及带有此装置的仿真手柄发
冰箱隐形门折弯模具及其折弯方法发明专利
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Patent of loading and reclaiming servo simulation manipulator
Patent of production line transmission centering mechanism and method
Patent of sheet metal rolling device and method
Patent of manipulator and its clamping method
Patent of sheet metal part composite machining die method
Patent of charging and discharging machine and its control method
Patent of Robot control system and its control method
Patent of automatic centering device, centering method, and simulation handle with this device
Patent of refrigerator invisible door bending die and its bending method

荣获100多项国家发明专利及实用新型专利 Won more than 100 national invention patents and utility model



合作与交流 Cooperation and Exchange



公司一直与上海交通大学、燕山大学、中国海洋大学、济南铸锻所、中国重型机械研究院、马钢设计院等高校及科研院所保持着长期战略合作关系，通过与高校和科研院所的交流与合作提高技术创新能力。

HDMECH has maintained long term strategic relationship with Shanghai Jiao Tong University, Yanshan University, Ocean University of China, Ji'nan JFMMRI, Chinese Heavy Machinery Research Institute, Maanshan Institute and other universities and research institutes, and to improve the technological innovation capability through the exchange and cooperation with universities and research institutes

伺服仿真机械手

Servo Emulational Manipulator

Perfect Product / International Hdmech
精细化的产品 / 国际化的海德马克

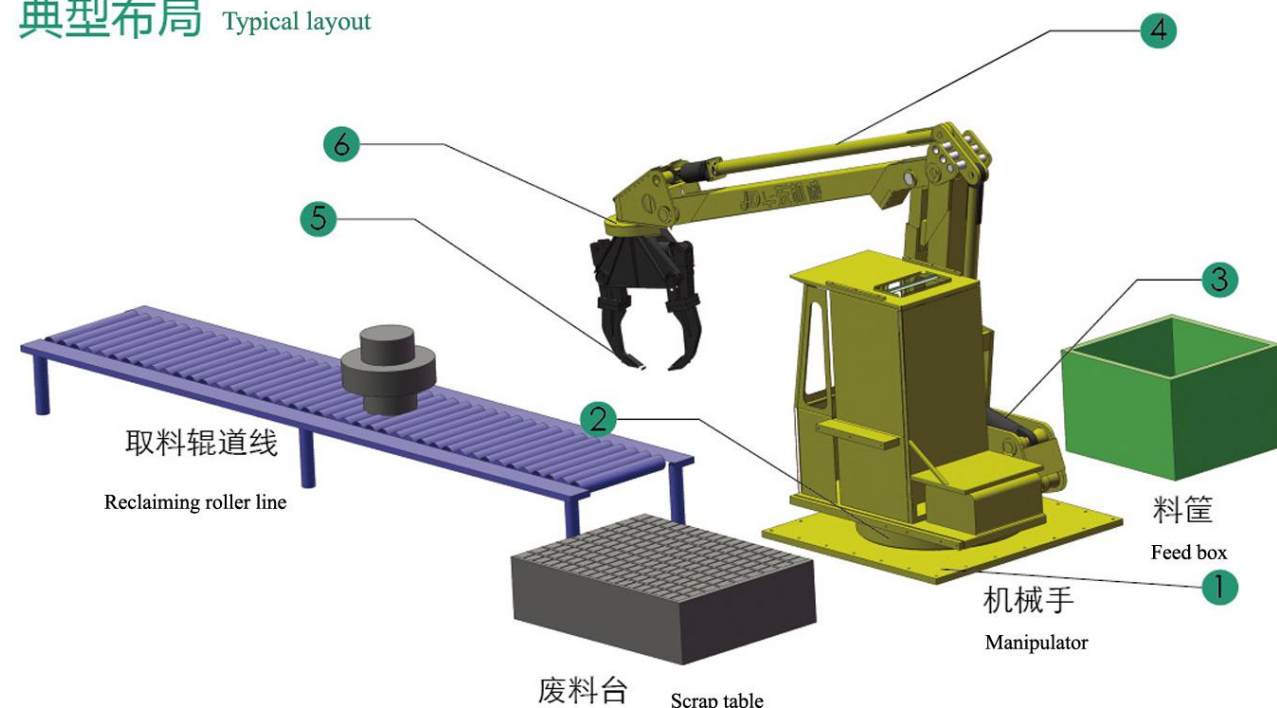
HDMECH
海德马克

概述 General

该ZGFZ系列伺服仿真机械手专门针对铸造工艺，服务于铸锻行业的专业机械手；能够快速完成各种规格铸锻坯料两点间的传输，并且不夹伤工件，比如从落砂床到板式输送机；也可以实现铸锻件从模锻压机到切边机，从切边机到料筐等各工位之间的快速转移。此伺服仿真机械手能够实现以下动作：车体行走、车体回转、夹钳升降、夹钳伸缩、夹钳旋转、夹钳仰俯、夹钳摆动、夹钳夹紧等

The ZGFZ series servo manipulator is special for casting process, and it is professional mechanical hand for forging industry. It can quickly complete the transmission of various specifications of casting blank between two points, and does not crush the workpiece, such as from the sand bed to the plate conveyor; can also be achieved to quickly transfer the casting workpiece from casting forging press to edge trimmer, from edge trimmer to the machine frame and each station. The servo manipulator can achieve the following actions: body walking, body rotation, lifting clamp, clamp stretch, clamp rotation, clamp back down, clamp swing, clamping.

典型布局 Typical layout



- | | | | |
|-----------|--------------------------------|-----------|----------------------|
| ①: 安装支座 | Mounting support | ②: 车体回转支撑 | Body slewing bearing |
| ④: 四连杆机构 | Four-bar Linkage str | ⑤: 夹钳 | Clamp |
| ③: 伸缩油缸 | Telescopic cylinder | | |
| ⑥: 钳头回转机构 | Clamping head rotary mechanism | | |

技术优点 Technical advantage

伺服反馈，减缓疲劳
Servo response, reduce fatigue

传动精密，运行无阻力
Transmission precision, running without resistance.

程序计算，控制精度高
Program calculation, high control accuracy

机械手所有位置受到的载荷进行精确计算，并用应变仪对程序进行检测，以确保程序的可靠性。
All the positions of the manipulator are accurately calculated, and the strain gauge is used to test the program to ensure the reliability of the program.

液压系统精度高 无污染
High precision hydraulic system without pollution

液压油箱采用不锈钢制造，对于伺服阀非常重要。无锈、无涂料脱落，避免伺服阀出现问题。并且油箱是正压头，即在泵的上部以减少泵磨损。

Hydraulic tank is made of stainless steel, it is very important for servo valve. No rust, no paint off, avoid servo valve causing problems. And the fuel tank is a positive pressure head, that is, located at the upper part of the pump to reduce the pump wearing.

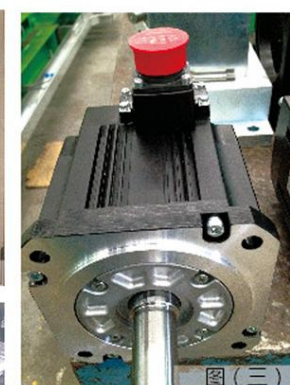
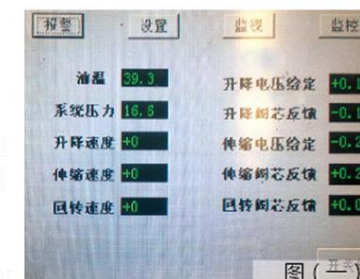
结构紧凑，安全可靠
Compact structure, safe and reliable

机械手工作臂展长，所以需要可靠的力矩支撑。并且机架受三重保护：

- 1) 手臂上及夹具与腕关节之间装有减震器。
- 2) 压力减少：检测垂直手臂的角度，根据其位置增加或减少压力。这意味着油缸力减少，因此，作用在机械手上的力减少了，从而减少对设备的损坏。
- 3) 加速度控制：在控制系统中有该功能使得每次作用在机架上的最高应力大大减少。

The mechanical work arm is long, so it needs reliable torque support. And the frame is protected by three parts:

- 1) the shock absorber is equipped between the arm and the wrist joint.
- 2) pressure reduction: detect the angle of the vertical arm, increase or decrease the pressure according to its position. This means that the force of the cylinder is reduced, so that the force acting on the manipulator is reduced, thereby reducing the damage to the equipment.
- 3) acceleration control: there is this function in this control system, the maximum stress at each acting force on the frame is greatly reduced.



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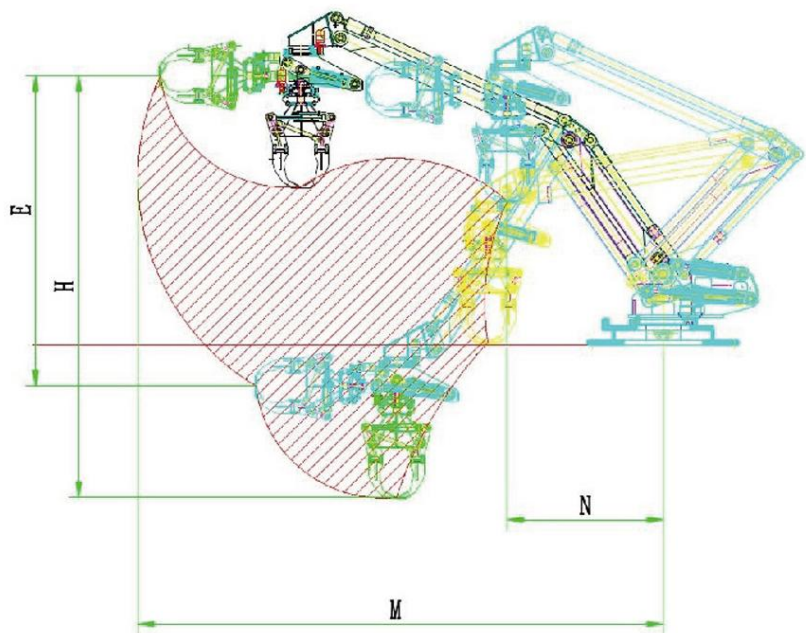
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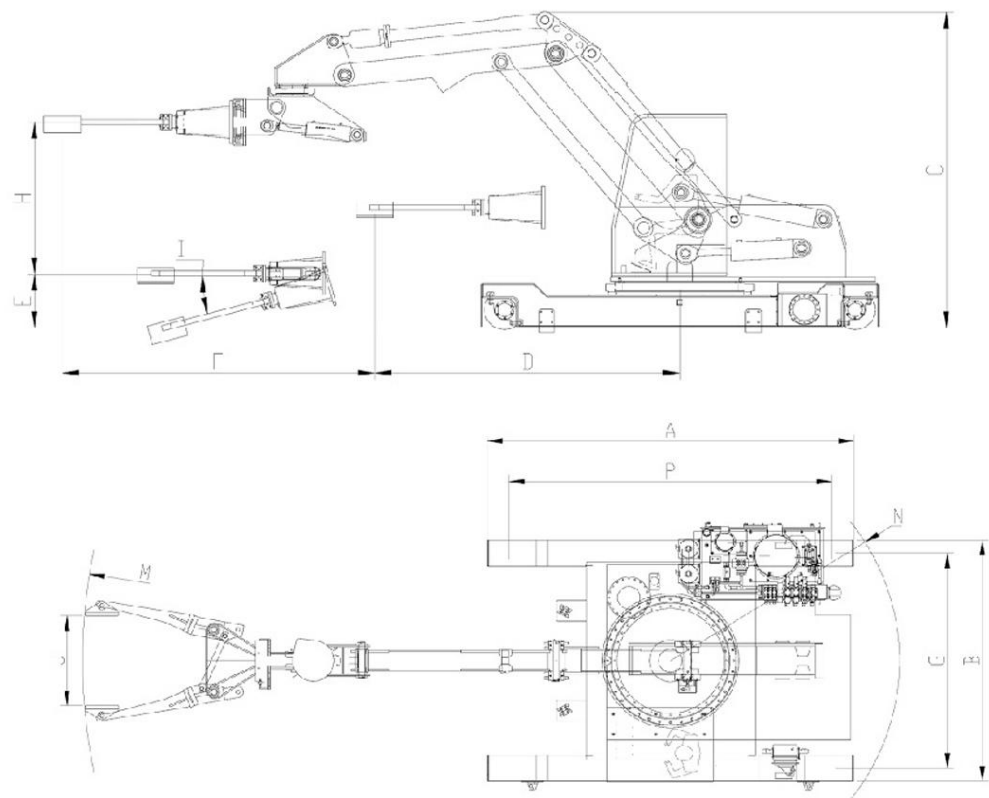
动作轨迹

Action track



外形图

Outline drawing



技术参数 Parameter list

技术规格					300kg	500kg	800kg	1000kg	1200kg	1500kg	2000kg	3000kg	5000kg
整体尺寸	Overall dimension	工作回转半径Max (mm)	Max. working radius	M	5500	6300	6850	6850	7150	7150	7500	7800	8250
		工作回转半径Min (mm)	Min. working radius	N	≤3200	≤3800	3450	3450	3600	3600	3700	3800	4150
		总长	Total length	A	3500	3800	5600	6000	6500	7000	7000	7000	7200
		总宽	Total width	B	2800	2800	3050	3500	3800	4300	4500	4820	5000
		总高	Total height	C	3000	3000	3250	3250	3400	3800	3820	3860	3910
机器人装机功率 (kW)			Installed power	40	60	65	65	70	75	85	95	110	
机器人重量 (Kg)			Weight	6000	8000	11500	15000	21000	22500	25000	30000	40000	
控制方式			Control mode	手动 Manual									
安装方式			Installation mode	移动 固定 Move/ Be fixed									
钳口运动范围	Jaw movement range	最小 (mm)	Min	D	3000	3650	3200	3200	3350	3350	3450	3550	3900
		最大 (mm)	Max		5300	6150	6600	6600	6900	6900	7250	7550	8000
		最大 (mm)	Max	E	3450	3450	2850	2250	2300	2500	2800	3000	3000
		最小 (mm)	Min		-500	-500	650	650	900	900	900	900	900
		行程 (mm)	Stroke	F	2300	2500	3400	3400	3650	4500	4500	4500	4500
夹钳中心距地面	Distance between Clamp center and	速度 (mm/s)	Speed		1000	1000	800	800	800	800	800	800	800
		运动距离 (mm)	Stroke		21000	21000	21000	21000	21000	21000	21000	21000	21000
		速度 (mm/s)	Speed		1100	1100	1050	1050	1000	1000	1000	1000	1000
		轨距 (mm)	Track	G	2000	2580	2580	2580	2800	3200	3200	3500	3700
		轨道长度 (m)	Track length		27	27	27	27	27	27	27	27	27
行走	Travel	动力系统	Power system	滑触线/拖链 Sliding contact line / drag chain									
		最低中心高 (mm)	Minimum center distance		-500	-500	650	600	900	900	900	900	900
		运动距离 (mm)	Moving distance	H	3950	3950	2200	1600	1400	1600	1900	2100	2100
		速度 (mm/s)	Speed		550	550	550	550	500	500	500	500	500
		回转角度	Rotation angle		±180	±180	±180	±180	±180	±180	±180	±180	±180
伸缩	Telescopic	速度 (°/s)	Speed		60	60	45	45	30	30	30	30	30
		倾斜角度 (上)	Upward angle	I	0	0	0	0	0	0	0	0	0
		倾斜角度 (下)	Downward angle		-90	-90	-90	-90	-90	-90	-90	-90	-90
		速度 (°/s)	Speed		15	15	15	15	10	10	10	10	10
		回转角度	Rotation angle		±170	±170	±150	±150	±150	±150	±150	±150	±150
回转	Body rotation	速度 (°/s)	Speed		60	60	45	45	45	45	45	45	45
		夹持范围 (mm)	Clamping range	J	0-500	100—780	50-1200	100—1200	150—1200	200—1400	200—1500	200—1500	200—1500
		开口/闭合时间	Speed		<5	<5	<5	<5	<5	<5	<5	<5	<5

典型业绩 Typical performance



无锡透平叶片800KG伺服仿真机械手



江西景德镇航空铸锻1000KG伺服仿真机械手